

ISPS-6 / ITTW2015 PROGRAM

15 Sept. (Tue)

Time	Number	Title	page
8:50-9:10	15W	Welcome/History	
Agency Talks Hardy Hall			
9:10-9:35	15Ag-1	Overview of Utilization of ISS/"Kibo" in Japan, Present Status and the Future Masahiro Takayanagi <i>JAXA</i>	1
9:35-10:00	15Ag-2	CNES, the French Space Agency Physical Science Program Christophe Delaroche <i>CNES</i>	1
10:00-10:25	15Ag-3	The German Microgravity Program in Physical Sciences Rainer Kuhl*, Rainer Forke, Thomas Driebe <i>DLR Space Administration, German Aerospace Center, Germany</i>	1
10:40-11:05	15Ag-4	International Cooperation in Physical Sciences Research in Space in the Framework of ESA's ELIPS Programme Olivier Minster, Luigi Cacciapuoti, Astrid Orr, Balazs Tóth <i>European Space Agency, ESTEC, Noordwijk, The Netherlands</i>	2
11:05-11:30	15Ag-5	Overview of NASA's Physical Sciences Research Program Francis P. Chiaramonte <i>NASA</i>	2
11:30-11:55	15Ag-6	China's Space Missions of Physical Science in The Near Future Yidong Gu <i>Technology and Engineering Center for Space Utilization, Chinese Academy of Sciences(CSU,CAS)</i>	2
Society Talks Hardy Hall			
11:55-12:10	15Soc-1	The Vision, Strategy and Roadmap of Space Environment Utilization Science Masamichi Ishikawa <i>The Japan Society of Microgravity Application</i>	2
12:10-12:40	15Soc-2	Reusable Sounding Rocket Hiroyuki Ogawa, Satoshi Nonaka, Yoshihiro Naruo, Takashi Ito and Yoshifumi Inatani <i>Japan Aerospace Exploration Agency</i>	2
Plenary Talks Hardy Hall			
14:00-14:30	15PI-1	Electromagnetic Levitation Experiments on the ISS Douglas M. Matson <i>Tufts University</i>	3
14:30-15:00	15PI-2	Capillary Channel Flows - The CCF-Experiment on the International Space Station Michael Dreyer*, Peter Canfield, Max Bronowicki <i>University of Bremen, Faculty of Production Engineering – Mechanical and Process Engineering, Department of Fluid Mechanics, ZARM</i>	3
15:00-15:30	15PI-3	FASES – A Facility Dedicated to Emulsion Stability in Microgravity. Mickael Antoni* ¹ , Murielle Schmitt ¹ , Daniele Clausse ² , Isabelle Pezron ² , Francesca Ravera ³ , Libero Liggieri ³ <i>1 MADIREL UMR/CNRS 7246, Aix Marseille University, France, 2 Sorbonne Universités, Université de Technologie de Compiègne, EA 4297 TIMR, France, 3 Istituto per l'Energetica e le Interfasi (IENI), Consiglio Nazionale delle Ricerche, Genova, Italy</i>	3
15:30-16:00	15PI-4	In Situ and Real Time Observation of Microstructure Formation during Directional Solidification of a 3D-alloy: Experiments in the DECLIC-DSI N. Bergeon ^{1*} , F.L. Mota ¹ , J. Pereda ¹ , D. Tournet ² , J.M. Debierre ¹ , R. Guérin ¹ , A. Karma ² , R. Trivedi ³ and B. Billia ¹ <i>1 IM2NP, Aix-Marseille Université and CNRS, Marseille, France, 2 Physics Department, Northeastern University, Boston, USA, 3 Department of Materials Science & Engineering, Iowa State University, USA</i>	4
16:15-16:45	15PI-5	New Insights on Impurity Effects During Crystal Growth Under Various Gravity Conditions Alexander E.S. Van Driessche ^{1*} , Mike Sleutel ¹ , James Lutsko ² , Dominique Maes ¹ , Katsuo Tsukamoto ³ , Yoshihisa Suzuki ⁴ , Izumi Yoshizaki ⁵ <i>1 Structural Biology Brussels, Vrije Universiteit Brussel, Belgium. 2 Center for Nonlinear Phenomena and Complex Systems, Université Libre de Bruxelles, Belgium. 3 Graduate School of Engineering, Osaka University, Japan. 4Department of Life System, University of Tokushima, Japan, 5 Japan Aerospace Exploration Agency, Tsukuba Space Center, Japan</i>	4
16:45-17:15	15PI-6	Droplet Clouds Combustion Experiment "Group Combustion" in the Kibo on board the ISS Masato Mikami ^{1*} , Masao Kikuchi ² , Yuji Kan ² , Takehiko Seo ¹ , Hiroshi Nomura ³ , Yusuke Suganuma ³ , Osamu Morie ⁴ , Daniel L. Dietrich ⁵ <i>1 Graduate School of Science and Engineering, Yamaguchi University, Japan, 2 Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency, Japan, 3 College of Industrial Technology, Nihon University, Japan, 4 Graduate School of Engineering, Kyushu University, Japan, 5 Glenn Research Center, National Aeronautics and Space Administration, USA.</i>	4
17:15-17:45	15PI-7	Gas Liquid Pipe Flow in Tube in Microgravity: Recent Progress and Future Prospects Catherine Colin <i>University of Toulouse</i>	5
17:45-18:15	15PI-8	Interfacial Thermal Fluid Phenomena in Thin Liquid Films: Preparation Experiments on ISS Oleg A. Kabov <i>Kutateladze Institute of Thermophysics, Siberian Branch of Russian Academy of Sciences, Novosibirsk, Russia</i>	5
Engineering Special Talk Hardy Hall			
18:15-18:40	15Eng-1	Birth and Evolution of the ISS: Past, Present and Future Yoshiaki Ohkami <i>Professor Emeritus, Tokyo Institute of Technology</i>	5

Oral Presentations on 16-18 September

Time for presentation: **20 minutes including 5 minutes** for discussion,
Time for presentation for Keynotes: **25 minutes including 5 minutes** for discussion (Keynotes are designated by 'K').

16 Sept. (Wed) AM

[FIMa] Fluid Science / Marangoni Hardy Hall

Chair: Hendrik Kuhlmann, Co-Chair: Nobuyuki Imaishi

Time	Number	Title	page
8:30-8:55	16FIMa-1K	Modelling of the Experiments in Liquid Bridges Conducted on the ISS Denis Melnikov ^{1*} , Valentina Shevtsova ¹ , Taishi Yano ² , Koichi Nishino ² <i>1 Microgravity Research Centre, EP CP 165 / 62, University of Brussels (ULB), Belgium, 2 Department of Mechanical Engineering, Yokohama National University, Japan</i>	6
8:55-9:15	16FIMa-2	Effect of Heat Transfer between Liquid-Gas Interface on the Instability and Oscillation Mode of Marangoni Convection in Liquid Bridge in Space Experiment Taishi Yano ^{1*} , Koichi Nishino ¹ , Ichiro Ueno ² , Satoshi Matsumoto ³ <i>1 Department of Mechanical Engineering, Yokohama National University, 2 Department of Mechanical Engineering, Faculty of Science and Technology, Tokyo University of Science, 3 Institute of Space Astronautical Science, Japan Aerospace Exploration Agency</i>	6
9:15-9:35	16FIMa-3	Effect of Free Surface Heat Loss on Oscillation Mechanism for Marangoni Convection in Liquid Bridge Yasuhiro Kamotani ^{1*} , Satoshi Matsumoto ² , Koichi Nishino ³ , Ichiro Ueno ⁴ , Nobuyuki Imaishi ⁵ , Atsuki Komiya ⁶ <i>1 Department of Mechanical and Aerospace Engineering, Case Western Reserve University, 2 Institute of Space and Astronautical Science, Jaoan Aerospace Exploration Agency, 3 Department of Mechanical Engineering, Yokohama National University, 4 Department of Mechanical Engineering, Tokyo University of Science, 5 Kyushu University, 6 Department of Mechanical Engineering, Tohoku University</i>	6
9:35-9:55	16FIMa-4	Effective Marangoni Number and Spatiotemporal Structure of Flow Velocity in High Prandtl Number Fluid Shinichi Yoda ^{1,2,3*} , Satoshi Matsumoto ¹ , Ichiro Ueno ⁴ <i>1 ISAS/JAXA, 2 Kumamoto Univ., 3 CAS, 4 Tokyo University of Science</i>	7
9:55-10:15	16FIMa-5	Strategic Study of Thermocapillary Convection Occurred in Liquid Bridge under Terrestrial and Microgravity Conditions Satoshi Matsumoto* <i>Japan Aerospace Exploration Agency, Japan</i>	7

[FIMa] Fluid Science / Marangoni Hardy Hall

Chair: Valentina Shevtsova, Co-Chair: Satoshi Matsumoto

10:30-10:55	16FIMa-6K	Investigation of PAS Phenomena in High Resolution Thermocapillary Liquid Bridge Thomas Lemee*, Hendrik Kuhlmann <i>Institute of Fluid Mechanics and Heat Transfer, TU Wien</i>	7
10:55-11:15	16FIMa-7	Occurring Condition and Formation Process of Particle Accumulation Structure (PAS) under Higher Marangoni Numbers in Half-Zone Liquid Bridge Aro Toyama ^{1*} , Masakazu Godota ¹ , Toshihiro Kaneko ² , Ichiro Ueno ² <i>1 Division of Mechanical Engineering, School of Science and Technology, Tokyo University of Science, 2 Department of Mechanical Engineering, Faculty of Science and Technology, Tokyo University of Science</i>	7
11:15-11:35	16FIMa-8	Modelling the Motion of Finite-Size Particles near a Thermocapillary Free-Surface by a Two-Way-Coupling Approach Francesco Romanò*, Hendrik C. Kuhlmann <i>Institute of Fluid Mechanics and Heat Transfer, Vienna University of Technology, Austria</i>	8
11:35-11:55	16FIMa-9	Effect of Curvature on the Onset of Hydrothermal Wave Instabilities Nobuyuki Imaishi ^{1*} , Michael Ermakov ² , Wanyuan Shi ³ <i>1 Kyushu University, 2 A. Ishlinsky Institute for Problems in Mechanics of RAS, Russia, 3 College of Power Engineering, Chongqing University, China</i>	8
11:55-12:15	16FIMa-10	Study on Oscillation Behavior and Transition Process of Buoyant -Thermocapillary Convection in an Open Annular Pool Duan Li*, Zhang Li, Kang Qi <i>Institute of Mechanics, Chinese Academy of Sciences, 100190, Beijing, China</i>	8
12:15-12:35	16FIMa-11	High Frequency Vibration Effect on Thermocapillary Flow in a Liquid Zone Tatyana Lyubimova*, Robert Skuridyn <i>Computational Fluid Dynamics Laboratory, Institute of Continuous Media Mechanics UB RAS, Russia</i>	9

[Ma] Materials Science Room B

Chair: Joonho Lee, Co-Chair: Tetsu Mieno

8:30-8:50	16Ma-1	Synthesis of Si-Ge Alloys with High Thermoelectric Performance by Application of Microgravity Phenomena Hideaki Nagai ^{1*} , Yuto Kabeya ² , Tsuyoshi Hamada ² , Takeshi Okutani ² <i>1 Advanced Manufacturing Research Institute, National Institute of Advanced Industrial Science and Technology, Japan, 2 Graduate School of Environment and Information Sciences, Yokohama National University, Japan</i>	10
8:50-9:10	16Ma-2	Spatial Distribution of Magnetic Anisotropy Measured at the Surface of Amorphous Silica Using Microgravity Condition Chiaki Uyeda <i>Institute of Earth and Space Science, Osaka University</i>	10
9:10-9:30	16Ma-3	Ammonia Oxidation at Pt Modified Mesoporous Carbon Electrodes Under Microgravity Conditions Carlos Poventud, Raul Acevedo, Eduardo Nicolau and Carlos R Cabrera* <i>University of Puerto Rico</i>	10
9:30-9:50	16Ma-4	Gravity Effects on the Formation of Ultrafine Particles by the Gas Evaporation Method Yuki Kimura <i>Institute of Low Temperature Science, Hokkaido University, Japan</i>	11

[Ma] Materials Science Room B

Chair: Junpei Okada, Co-Chair: Thomas Volkman

Time	Number	Title	page
10:30-10:50	16Ma-6	Transient Behavior in Directional Solidification of a Bulk Transparent Model Alloy: Analysis of DECLIC-DSI Experiments Onboard ISS Fatima Mota ^{1*} , Nathalie Bergeon ¹ , Damien Tourret ² , Alain Karma ² , Rohit Trivedi ³ , Bernard Billia ¹ <i>1 IM2NP - Institut des Matériaux Microélectronique Nanosciences de Provence, Marseille - France, 2 Physics Department, Northeastern University - Boston, USA, 3 Department of Materials Science & Engineering - Iowa State University, USA</i>	11
10:50-11:10	16Ma-7	Dendrite Growth Kinetics in Undercooled Melts of D2 Tool Steels Jonas Vallotton ^{1,2} , Dieter M Herlach ² , Hani Henein ¹ <i>1 Advanced Materials and Processing Laboratory, University of Alberta, Canada, 2 Institut für Materialphysik im Weltraum, Deutsches Zentrum für Luft- und Raumfahrt, Germany</i>	12
11:10-11:30	16Ma-8	Contactless Processing of Doped SiGe Melts Based on MSL-EML Under Microgravity Conditions Yuansu Luo [*] , Bernd Damaschke, and Konrad Samwer <i>1. Physics Institute of University Göttingen, Germany</i>	12
11:30-11:50	16Ma-9	Metastable Phase Formation in Peritectic Systems Under Terrestrial and Microgravity Conditions Olga Shuleshova ^{1*} , Thomas Volkman ² , Christian Karrasch ^{2,3} , Douglas Matson ⁴ , Wolfgang Löser ² <i>1 Institute for Complex Materials, Leibniz Institute for Solid State and Materials Research Dresden, Germany, 2 Institute of Materials Physics in Space, German Aerospace Center, Germany, 3 Institute of Experimental Physics, Ruhr University of Bochum, Germany, 4 Department of Mechanical Engineering, Tufts University, USA, 5 Institute for Solid State Research, Leibniz Institute for Solid State and Materials Research Dresden, Germany</i>	12

[Th] Thermophysical Property Room C

Chair: Masahito Watanabe, Co-Chair: Tadahiko Masaki

8:30-8:50	16Th-1	Bonding Characteristics of High Temperature Liquids Studied by Electrostatic Levitator Junpei Okada ^{1,2*} , Patrick.-L. Sit ³ , Takehiko Ishikawa ¹ , Yasuhiro Watanabe ⁴ , Bernardo Barbiellini ⁵ , Arun Bansil ⁵ , Masayoshi Ito ⁶ , Yoshiharu Sakurai ⁶ , Kaoru Kimura ⁴ , Susumu Nanao ^{1,4} <i>1 ISAS/JAXA, 2 PRESTO/JST, 3 City Univ. Hong Kong, 4 Univ. Tokyo, 5 Northeastern Univ., 6 JASRI/SPring-8</i>	13
8:50-9:10	16Th-2	Fabricating Optical Glasses Using Containerless Processing Jianiding Yu <i>Shanghai Institute of Ceramics, Chinese Academy of Sciences, China</i>	13
9:10-9:30	16Th-3	“Soret-Facet” Experiments Aboard the ISS-JEM S.Suzuki ^{1*} , Y.Hashimoto ¹ , T.Osada ¹ , M.Tomaru ¹ , Y.Mori ¹ , Y.Inatomi ² , T.Masaki ³ , M.Watanabe ⁴ , A.Mizuno ⁴ , I.Ueno ⁵ , T.Yamane ⁶ , T.Itami ⁷ , Y.Nakamura ⁸ , M.Katsuta ⁸ , Y.Ito ⁸ , H.Ohkuma ⁸ , T.Shimaoka ⁹ , T.Sone ¹⁰ <i>1 Waseda University, Japan, 2 Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency, Japan, 3 Shibaura Institute of Technology, Japan, 4 Gakushuin University, Japan, 5 Tokyo University of Science, Japan, 6 Toyama University, Japan, 7 Hokkaido University, Japan, 8 Japan Aerospace Exploration Agency, Japan, 9 Japan Space Forum, Japan, 10 Japan Manned Space Systems Corporation, Japan</i>	13
9:30-9:50	16Th-4	Ba(Ti1-xZrx)2O5 Glasses Prepared by Aerodynamic Levitator Chi-Hoon Lee ¹ , Sang-Kyo Jung ¹ , Shinichi Yoda ² , Won-Seung Cho ^{1*} <i>1 School of Materials Science and Engineering, Inha University, Korea, 2 Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency, Japan</i>	13
9:50-10:10	16Th-5	Thermophysical Property Measurements of Molten Oxide by Aerodynamic Levitator Kenta Onodera ^{1*} , Masahito Watanabe ¹ , Florian Kargl ² <i>1 Gakushuin University, 2 Deutsches Zentrum für Luft- und Raumfahrt</i>	14

[Fu] Fundamental Science Room C

Chair: Luigi Cacciapuoti, Co-Chair: Jason Williams

10:30-10:55	16Fu-1K	Research Opportunities Utilizing ISS: Fundamental Physics Inseob Hahn ¹ ,** Nan Yu ¹ , Ulf Israelsson ¹ , Mark Lee ² <i>1 Jet Propulsion Lab, Caltech, USA, 2 NASA HQ, USA.</i>	14
10:55-11:15	16Fu-2	Forced Clustering in Dust Clouds in Microgravity Experiments Andrei Vedernikov ^{1*} , Daniyar Balapanov ¹ , Anselmo Cecere ² , Jürgen Blum ³ , Ingo von Borstel ³ , Rainer Schräpler ³ <i>1 Microgravity Research Centre, Université Libre de Bruxelles, Belgium, 2 Aerospace Engineering Division, Università di Napoli Federico II, Italy, 3 Institut für Geophysik und Extraterrestrische Physik, Technische Universität Braunschweig, Germany</i>	14
11:15-11:35	16Fu-3	Space Plasma Generator for Artificial Ionospheric Control James Y.-B. Kim ^{1*} , Dennis Papadopoulos ² , Eric Enig ¹ , Daniel Bentz ¹ <i>1 Enig Associates, Inc., Bethesda, MD, USA, 2 University of Maryland, College Park, MD, USA</i>	14
11:35-11:55	16Fu-4	PK-4: A Complex Plasma Laboratory on Board the ISS Alexander Usachev ² , Markus Thoma ³ , Martin Fink ¹ , Andrey Lipaev ² , Andrey Zobnin ² , Vladimir Molotkov ² , Sebastian Albrecht ⁴ , Christian Deysenroth ⁴ , Christian Rau ⁴ , Hubertus Thomas ¹ , Oleg Petrov ² , Vladimir Fortov ² , Gregor Morfill ⁴ <i>1 Research Group for Complex Plasmas, German Aerospace Center (DLR), Germany, 2 Joint Institute for High Temperatures, Russian Academy of Sciences, Russia, 3 Justus Liebig Universität Giessen, Germany, 4 Max Planck Institute for Extraterrestrial Physics, Germany</i>	15
11:55-12:15	16Fu-5	Behavior of Fine Particle (Dust) Clouds in Plasmas Under Gravity and Microgravity Hiroo Totsuji ^{1*} , Kazuo Takahashi ² and Satoshi Adachi ³ <i>1 Okayama Univ. Japan, 2 Kyoto Inst. Tech. Japan, 3 JAXA, Japan</i>	15
12:15-12:35	16Fu-6	Experimental Investigation of New Apparatus for Complex Plasmas Experiments in Microgravity Satoshi Adachi ^{1,2*} , Kazuo Takahashi ³ , Hiroo Totsuji ⁴ <i>1 Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency, Japan, 2 School of Physical Sciences, SOKENDAI, Japan, 3 Department of Electronics, Kyoto Institute of Technology, Japan, 4 Okayama University, Japan</i>	15

[Col] Colloidal Science Room D

Chair: Junpei Yamanaka, Co-Chair: Yoshihisa Suzuki

8:30-8:55	16Col-1K	Study on the Standard Theories of Colloidal Dispersions Ikuo S. Sogami [*] <i>Department of Physics, Kyoto Sangyo University, Japan</i>	17
8:55-9:15	16Col-2	Molecular Dynamics Simulation of Charged Colloidal Dispersion Using a Molecular Model Yosuke Kataoka [*] <i>Hosei University, Japan</i>	17

Time	Number	Title	page
9:15-9:35	16Col-3	Some Details of Gravitational Tempering in Colloidal Epitaxy Using Hard-Sphere Model Atsushi Mori ^{1*} , Yoshihisa Suzuki ¹ , Masahide Sato ² <i>1 Institute of Technology and Science, Tokushima University, 2 Information Media Center, Kanazawa University</i>	17
9:35-9:55	16Col-4	Crystallization and Structural Phase Transition of Colloids Junpei Yamanaka*, Chiho Kakihara, Misato Suko, Akiko Toyotama, Tohru Okuzono <i>Nagoya City University</i>	17
9:55-10:15	16Col-5	Microscopic Observation of "Voids" in Silica Colloidal Dispersions Kensaku Ito <i>Department of Environmental Applied Chemistry, University of Toyama, Japan</i>	18

[So] Soft Matter Room D

Chair: Yuji Yamashita, Co-Chair: Libero Liggieri

10:30-10:55	16So-1K	Results from the FASTER (Facility for Adsorption and Surface Tension Studies) onboard the International Space Station Michele Ferrari ¹ , Giuseppe Loglio ¹ , Moshen Karbashi ² , Alyar Javadi ² , Juergen Kraegel ² , Volodja Kovalchuk ² , Reinhard Miller ² , Piero Pandolfini ¹ , Francesca Ravera ¹ , Eva Santini ¹ , Libero Liggieri ^{1*} <i>1 Istituto per l'Energetica e le Interfasi (IENI), Consiglio Nazionale delle Ricerche, Italy. 2 Max-Planck Institut fuer Kolloid und Grenzflaechenforschung, Germany.</i>	18
10:55-11:15	16So-2	Microgravity Researches in the Field of Physical Chemistry in Japan Makoto Natsuisaka ^{1*} , Yuji Hirai ² , Masatsugu Shimomura ² , Takashi Mashiko ³ , Kaoru Tsujii ⁴ , Yasuhiro Nishiyama ⁵ , Shigeru Deguchi ⁶ , Yoshihisa Inoue ⁷ , Yuji Yamashita ⁸ , Takahiro Yamazaki ⁸ , Takeshi Endo ⁹ , Kenichi Sakai ⁹ , Hideki Sakai ⁹ , Masahiko Abe ⁹ , Kazutami Sakamoto ⁹ , Ko Okumura ¹⁰ <i>1 Japan Aerospace Exploration Agency, Japan, 2 Chitose Institute of Science and Technology, Japan, 3 Shizuoka University, Japan, 4 Chuo University, Japan, 5 Nara Institute of Science and Technology, 6 Japan Agency for Marine-Earth Science and Technology, Japan, 7 Osaka University, Japan, 8 Chiba Institute of Science, Japan, 9 Tokyo University of Science, Japan, 10 Ochanomizu University, Japan</i>	18
11:15-11:35	16So-3	Toward Controlling of Surfactant Foam Production in Space (Replacing Word Forward to Toward) Mehrafsoon Faqiryar, Yui Masumoto, Ko Urushibra, Arisa Yamada, Akane Ise, Yoshihito Mori <i>Department of Chemistry, Ochanomizu University, Japan</i>	18
11:35-11:55	16So-4	Effect of Gravity on the Stability of W/O Emulsion Prepared by AIM Yuji Yamashita ^{1*} , Takahiro Yamazaki ¹ , Satoshi Iijima ² , Takeshi Endo ² , Kenichi Sakai ² , Hideki Sakai ² , Masahiko Abe ² , Makoto Natsuisaka ³ , Kazutami Sakamoto ^{1,2} <i>1 Graduate School of Pharmacy, Chiba Institute of Science, Japan, 2 Department of Pure&Applied Chemistry, Tokyo University of Science, Chiba, 3 Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency, Japan</i>	19
11:55-12:15	16So-5	Synthesis of Highly Dispersed Hollow Silica Nanoparticles with Vesicle Template Method Takeshi Endo, Takahito Ooki, Hiroto Sohma, Taku Ogura, Kenichi Sakai, Masahiko Abe, Yuji Yamashita, Kazutami Sakamoto, Makoto Natsuisaka and Hideki Sakai <i>Department of Pure and Applied Chemistry, Faculty of Science and Technology, Tokyo University of Science</i>	19

[Ele] Electrochemical/Materials Processing in Space Engineering Room E

Chair: Takayuki Homma, Co-Chair: Michel Rosso

8:30-8:50	16Ele-1	Introductory Talk	20
8:50-9:10	16Ele-2	Overview on ESA-ITT: Electrochemical Nucleation & Growth Takayuki Homma, Yasuhiro Fukunaka <i>Waseda Univ.</i>	20
9:10-9:35	16Ele-3K	Electrochemical Deposition of Alloys: Fundamentals and Effect of Gravity on Composition and Thickness Distribution Giovanni Zangari <i>Univ. of Virginia</i>	20
9:35-10:00	16Ele-4K	Transition between Two Dendritic Growth Mechanisms in Electrodeposition Michel Rosso <i>Ecole Polytechnique, Paris</i>	20

[Ele] Electrochemical/Materials Processing in Space Engineering Room E

Chair: Vadim Lvovich, Co-Chair: Yoshitsugu Sone

10:30-10:50	16Ele-5	Electrochemical Interfacial Phenomena at Gas Evolving Electrode Hisayoshi Matsushima, Mikito Ueda <i>Hokkaido Univ.</i>	20
10:50-11:15	16Ele-6K	Photoelectrocatalysis: Unassisted Water Splitting in Microgravity Environments Matthias Richter ^{1,2} , Katharina Brinkert ³ , Hans Joachim Lewerenz ¹ <i>1 Joint Center for Artificial Photosynthesis, California Institute of Technology, Pasadena, CA, USA, 2 Brandenburg-Technical University Cottbus, Cottbus, Germany, 3 Imperial College London, London, UK</i>	20
11:15-11:35	16Ele-7K	Development of Unitized Reversible Fuel Cells Hiroshi Ito <i>AIST</i>	20
11:35-12:00	16Ele-8K	Investigations of Physical Processes in Microgravity Relevant to Space Electrochemical Power Systems Vadim F. Lvovich, Robert Green and Ian Jakupca <i>NASA Glenn Research Center, 21000 Brookpark Rd., Cleveland, OH 44135</i>	20
12:00-12:20	16Ele-9	Diagnostics of Li Battery in Satellite Yoshitsugu Sone <i>JAXA</i>	20

[IT-Co] Condensation Room A

Chair: Oleg Kabov, Mina Roudgar

8:30-8:55	16IT-Co-1K	A New Test Section for Investigation of Convective Condensation: Calibration and Preliminary Results Marco Azzolin ¹ , Stefano Bortolin ¹ , Lan Phuong Le Nguyen ² , Davide Del Col ^{1*} <i>1 Dipartimento di Ingegneria Industriale, Università degli Studi di Padova, Italy, 2 Laboratoire Plasma et Conversion d'Energie, Université Paul Sabatier, France</i>	21
8:55-9:15	16IT-Co-2	Nonlinear Effect of Surface Disturbances on Heat Transfer and its Modeling in Marangoni Dropwise Condensation Kentaro Kanatani ^{1*} , Alexander Oron ² and Hiroshige Kikura ¹ <i>1 Research Laboratory for Nuclear Reactors, Tokyo Institute of Technology, Japan 2 Department of Mechanical Engineering, Technion-Israel Institute of Technology, Israel</i>	21

Time	Number	Title	page
9:15-9:35	16IT-Co-3	External Condensation on Cylindrical Fin with Different Surface Roughness using HFE-7100 Working Fluid Andrey Glushchuk, Christophe Minetti, Cosimo Buffone* <i>Microgravity Research Centre, Université libre de Bruxelles</i>	21
9:35-9:55	16IT-Co-5	An Infrared Thermal Imager and CCD Investigation for Drop-wise Condensation on Specific Surface Xuwen Wang, Qiusheng LIU*, Zhiqiang Zhu and Xue Chen <i>Key Laboratory of Microgravity (National Microgravity Laboratory), Institute of Mechanics, Chinese Academy of Sciences</i>	22

[IT-HP] Heat Pipe Room A

Chair: Vadim Nikolayev, Husei Nagano

10:30-10:55	16IT-HP-1K	Large Diameter Pulsating Heat Pipes On Board The Esa Rexus 18 Sounding Rocket Francesco Creatini ¹ , Gian Marco Guidi ¹ , Federico Belfi ¹ , Giorgiomaria Cicero ¹ , Stefano Piacquadio ¹ , Davide Di Prizio ¹ , Davide Fioriti ¹ , Giulia Becatti ¹ , Giulia Orlandini ¹ , Alessandro Frigerio ¹ , Simone Fontanesi ¹ , Pietro Nannipieri ¹ , Michele Roghini ¹ , Nicolo' Morganti ¹ , Andrea Pasqui ¹ , Sauro Filippeschi ¹ , Paolo Di Marco ¹ , Mauro Marnelli ^{2*} , Marco Marengo ³ <i>1 DESTEC, University of Pisa, Italy. 2* Engineering Dep. University of Bergamo, Italy; 3 School of Computing and Mathematics, University of Brighton, UK.</i>	22
10:55-11:20	16IT-HP-2K	Effect of Thermodynamic Properties of Working Fluid on Loop-Heat-Pipe Performance Masahito Nishikawara*, Husei Nagano <i>Aerospace engineering, Nagoya university, Japan</i>	22
11:20-11:40	16IT-HP-3	Effect of Tube Conduction on the Single Branch Pulsating Heat Pipe Startup Vadim S. Nikolayev <i>Service de Physique de l'Etat Condense, CNRS UMR 3680, IRAMIS/DSM/CEA Saclay, France</i>	23
11:40-12:00	16IT-HP-4	Thermo-fluid Characteristics of a Loop Heat Pipe with Multiple Evaporators and Multiple Condensers under Vacuum Condition Xinyu Chang ^{1*} , Husei Nagano ² , Shun Okazaki ³ , Hiroyuki Ogawa ⁴ and Hiroki Nagai ⁵ <i>1 Department of Aerospace Engineering, Nagoya University, Japan, 2 Department of Aerospace Engineering, Nagoya University, Japan, 3 Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency, Japan, 4Institute of Space and Astronautical</i>	23
12:00-12:20	16IT-HP-5	Two-Phase Heat Transfer Mechanisms Within Plate Heat Exchangers: Experiments and Modeling Valentin Solotych, Jungho Kim <i>University of Maryland</i>	23
12:20-12:40	16IT-HP-6	The Effect of Vapor Groove Configuration of the Porous Media on the Heat Transfer Performance (Observation with Microscopic Infrared Thermography under the Atmospheric Condition) Kimihide Odagiri ^{1*} , Husei Nagano ¹ , Masahito Nishikawara ² <i>1 Department of Aerospace Engineering, Nagoya University, Japan, 2 Department of Mechanical Engineering, Toyohashi University of Technology, Japan</i>	24

16 Sept. (Wed) PM

[FIMa] Fluid Science / Marangoni Hardy Hall

Chair: Tatyana Lyubimova, Co-Chair: Koichi Nishino

13:30-13:55	16FIMa-12K	Basic Flow Patterns Induced by Thermocapillary Effect in Free Liquid Film Ichiro Ueno ^{1*} , Linhao Fei ¹ , Toshiaki Tamura ¹ , Toshihiro Kaneko ¹ , Donald R. Pettit ² <i>1 Tokyo University of Science, 2 NASA</i>	25
13:55-14:15	16FIMa-13	Liquid Film Volume Effect on Unsteady Thermocapillary Flow due to Hydrothermal Wave in a Thin Circular Liquid Film Takuya Yamamoto ^{1*} , Youhei Takagi ¹ , Yasunori Okano ¹ , Sadik Dost ² <i>1 Department of Materials Engineering Science, Osaka University, Japan, 2 Crystal Growth Laboratory, University of Victoria, Canada</i>	25
14:15-14:35	16FIMa-14	Bifurcation Routes to Chaos of Thermocapillary Convection in Two-Dimensional Liquid Layers of Finite Extent Bo Xun, Kai Li*, Wenrui Hu <i>Key Laboratory of Microgravity, National Microgravity Laboratory, Institute of Mechanics, Chinese Academy of Sciences, China</i>	25
14:35-14:55	16FIMa-15	Spatiotemporal Pattern Transient of Bénard-Marangoni Instability from Laminar Flow to Turbulence Wu Di*, Duan Li, Kang Qi <i>Institute of Mechanics, Chinese Academy of Sciences, China</i>	25
14:55-15:15	16FIMa-16	Behaviour of Miscible Liquid/Liquid Interface Subjected to Horizontal Vibrations Yuri Gaponenko, Viktor Yasnou, Aliaksandr Mialdun, Valentina Shevtsova* <i>Microgravity Research Centre, EP CP 165 / 62, University of Brussels (ULB), Belgium</i>	26

[Ma/Th] Materials Science / Thermophysical Property Room B

Chair: Nathalie Bergeon, Co-Chair: Douglas M. Matson

13:30-13:55	16Ma/Th-1K	Thermophysical Property Measurements of High Temperature Melts Using Electrostatic Levitators Takehiko Ishikawa ^{1*} , Junpei T. Okada ¹ , Yuki Watanabe ² <i>1Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency, Japan, 2Advanced Engineering Service, Co. Ltd., Japan</i>	27
13:55-14:20	16Ma/Th-2K	X-RISE: X-Ray Radiography in Space Environment Florian Karg*, Michael Balter, Christian Neumann, Elke Sondermann, Maike Becker, Stefan Klein, Alexander Boerngen, Peidong Yu, Matthias Sperl, Joerg Drescher, Andreas Meyer <i>Institut fuer Materialphysik im Weltraum, Deutsches Zentrum fuer Luft- und Raumfahrt (DLR), 51170 Koeln, Germany</i>	27
14:20-14:45	16Ma/Th-3K	Electrostatic Levitation in Space for the Measurement of Metallic Melt Properties Christian Neumann, Dirk Bräuer, Isabell Jonas, Sarah Zimmermann, Andreas Meyer* <i>Institute of Materials Physics in Space, German Aerospace Center, Cologne, Germany</i>	27
14:45-15:10	16Ma/Th-4K	Dendrite Growth Kinetics in Undercooled Metallic Melts Thomas Volkman ^{1*} , Christian Karrasch ² <i>1Institute of Materials Physics in Space, German Aerospace Center DLR, Germany, 2Institute of Experimental Physics, Ruhr University Bochum, Germany</i>	27

[Fu] Fundamental Science Room C			
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13:55-14:15	16Fu-8	Fundamental Physics Through Precision Measurements on ISS Nan Yu <i>Jet Propulsion Laboratory, California Institute of Technology, USA</i>	29
14:15-14:35	16Fu-9	Atom Interferometry with Ultracold Quantum Gases in a Microgravity Environment Jason Williams ^{1*} , Jose D'Incao ² , Sheng-wei Chiow ¹ and Nan Yu ¹ <i>1 Jet Propulsion Laboratory, California Institute of Technology, USA, 2 JILA, Department of Physics, University of Colorado at Boulder, USA</i>	29
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14:55-15:15	16Ed-2	JAXA's Educational Activities Through JEM Utilization Koichi Kikuchi, Riyo Yamanaka*, Takao Yamaguchi <i>JEM Utilization Center, JAXA</i>	30
15:15-15:35	16Ed-3	Education Outreach By Malaysian Team As Results From Asian Students' Parabolic Flight 2012 and 2013 Shahrul Kadri ^{1*} , Mohd Helmy Hashim ² , Mohd Ikhwan Hadi Yaacob ¹ , Rosly Jaafar ¹ , Mohd Tarmimi Illias ¹ , Kok Ken Hong ¹ <i>1 Sultan Idris Education University, Malaysia, 2 Malaysian National Space Agency</i>	30
15:35-15:55	16Ed-4	Space Cultural Utilization Yoichi Hasegawa <i>The One Earth Foundation, Japan</i>	30
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			Chair: Yoshihiro Urade, Co-Chair: Hiroaki Tanaka
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13:55-14:15	16Bi-2	Expression Profile of Oxidative Stress Genes in Spaceflight TK6 Lymphoblast Joshua Agee, Alexandria Thompson, Maurice Whalen Jr., Amenda Osborne and Ming Shenwu <i>Department of Biology, Tougaloo College, Tougaloo, MS 30174, USA</i>	31
14:15-14:35	16Bi-3	Noninvasive, Compact Systems for Multiparameter Monitoring with Novel Techniques Rinat Esenaliev <i>University of Texas Medical Branch</i>	31
14:35-14:55	16Bi-4	Orphan Drug Development for Duchenne Muscular Dystrophy by Protein Crystallization in Space Yoshihiro Urade <i>International Institute for Integrative Sleep Medicine, Tsukuba Univ., Japan</i>	32
14:55-15:15	16Bi-5	High-quality Protein Crystal Growth Experiments in Kibo on the International Space Station Mitsugu Yamada ¹ , Kiyohito Kihira ¹ , Yoshio Wada ¹ , Kunihiro Matsumoto ¹ , Hiroaki Tanaka ² , Sachiko Takahashi ² , Koji Inaka ³ <i>1 JEM Utilization Center, Japan Aerospace Exploration Agency, Japan, 2 Confocal Science Inc., Japan, 3 Maruwa Foods and Biosciences, Inc., Japan</i>	32
15:15-15:35	16Bi-6	High-Precision X-ray Crystallography of Proteins Atsushi Nakagawa ^{1,2} <i>1 Institute for Protein Research, Osaka University, Japan, 2 CREST, JST, Japan</i>	32
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13:50-14:15	16Ele-11K	Electrochemical Production of Oxygen from Lunar and Martian Soil J. Lee ¹ , R. W. Hyers ¹ , G. Lambotte ¹ and D. R. Sadoway ² <i>1 Univ. of Massachusetts, 2 MIT</i>	33
14:15-14:35	16Ele-12	Electrochemical Reactions for ISRU T. Goto <i>Doshisha Univ.</i>	33
14:35-14:55	16Ele-13	Si Electrodeposition in High Temperature Molten Salt T. Nohira <i>Kyoto University</i>	33
14:55-15:15	16Ele-14	Mode-selective Phonon Excitation in Widegap Semiconductors K. Hachiya <i>Kyoto University</i>	33
15:15-15:30	16Ele-15	Panel Discussion: All Speakers & Space Agencies	33
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			Chair: Qiusheng Liu, Luis A. Davalos
13:30-13:55	16IT-In-1K	Condensation on the Surfaces with the Same Wettability Mina Roudgar* <i>Laboratory of Physics of Surfaces and Interface, University of Mons, Av. Maistriau, 19, B-7000 Mons, Belgium</i>	34

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14:15-14:35	16IT-In-3	Simulation of the Vapour Bubble Growth on a Heated Plate Coupled With Marangoni Flow Under Microgravity in Presence of a Non-Condensable Gas Christophe Wylock ¹ , Alexey Rednikov ^{1*} , Pierre Colinet ¹ , Dominique Legendre ² , Catherine Colin ² <i>1 Transfers, Interfaces and Processes, Université Libre de Bruxelles, Belgium, 2 Institut de Mécanique des Fluides de Toulouse, University of Toulouse, France</i>	34
14:35-14:55	16IT-In-6	Stability of Gas Core of Cyclonic Two-Phase Separator in Microgravity Adel Kharraz ¹ , Ming-Fang Kang ¹ , Yasuhiro Kamotani ^{1*} <i>1 Department of Mechanical and Aerospace Engineering, Case Western Reserve University</i>	34

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[FI] Fluid Science Hardy Hall

Chair: Daniel Beysens , Co-Chair: Shinichi Yoda

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8:55-9:15	17FI-2	Stability of Vapor Film on Flat Horizontal Heater in the Subcooled Film Boiling Regime Vladimir Kononov ¹ , Tatyana Lyubimova ^{1,2} , Dmitriy Lyubimov ² <i>1 Computational Fluid Dynamics Laboratory, Institute of Continuous Media Mechanics UB RAS, Russia, 2 Theoretical Physics Department, Perm State University, Russia</i>	35
9:15-9:35	17FI-3	Enhanced Boiling Heat Transfer of FC-72 over Staggered Micro-Pin-Finned Surfaces with Jet Impingement Yonghai Zhang*, Jinjia Wei, Xin Kong <i>State Key Laboratory of Multiphase Flow in Power Engineering, Xi'an Jiaotong University, Xi'an, China</i>	35
9:35-9:55	17FI-5	Measurement of the Soret and Diffusion Coefficients on the ISS Aliaksandr Mialdun*, Valentina Shevtsova <i>Microgravity Research Centre, EP CP 165 / 62, University of Brussels (ULB), Belgium</i>	36

[FI] Fluid Science Hardy Hall

Chair: Yonghai Zhang , Co-Chair: Koichi Nishino

10:30-10:55	17FI-6K	Special and Curious Behaviour of Near-Critical and Supercritical Fluids Daniel Beysens ^{1*} , Yves Garrabos ² and Bernard Zappoli ³ <i>1 PMMH, Ecole Supérieure de Physique et Chimie ParisTech and CEA-Grenoble, France, 2 ICMCB, Centre National de Recherches Scientifiques, France, 3 Centre National d'Etudes spatiales, France</i>	36
10:55-11:15	17FI-8	Liquid Parahydrogen Reorientation with Non-Isothermal Walls upon a Gravity Step Reduction Sebastian Schmitt*, Michael E. Dreyer <i>ZARM, University of Bremen, Germany</i>	36
11:15-11:35	17FI-9	Fluid Dynamic Investigation of Stability Mechanism by Pressure Reduction in Aero Dynamic Levitator Ryoji Imai ^{1*} , Shinichi Yoda ² , Cho Won-seung ³ <i>1 Murooran Institute of Technology, Japan, 2 Kumamoto University, Japan, 3 Inha University, Korea</i>	37
11:35-11:55	17FI-10	Gas Creep Flows in Microgravity Experiments with Time-Varying Thermal Profiles, Matter Sources and Moving Boundaries Andrei Vedernikov*, Daniyar Balapanov <i>Microgravity Research Centre, Université Libre de Bruxelles, Belgium</i>	37
11:55-12:15	17FI-11	Microgravity Experiments for Granular Gases, Fluids, and Packings Matthias Sper*, Peidong Yu, Philip Born <i>Institute of Materials Physics in Space, DLR, Cologne, Germany</i>	37

[Com] Combustion Science Room B

Chair: Masato Mikami, Co-Chair: Marika Orlandi

8:30-8:55	17Com-1K	Introduction of Combustion Research Project "FLARE" Utilizing ISS/KIBO for Fire Safety Standard in the Next Generation Osamu Fujita ^{1*} , Shuhei Takahashi ² , Hiroyuki Torikai ³ , Sandra L. Olson ⁴ , Carlos Fernandez-Pello ⁵ , Guillaume Legros ⁶ , Mitsuhiro Tsue ⁷ , Yuji Nakamura ⁸ , Kaoru Wakatsuki ⁹ , Harold Beeson ¹⁰ , David Hirsch ¹¹ , Marika Orlandi ¹² , Thomas Rhor ¹² , Naoko Sakurai ¹³ , Hiroyuki Shimamura ¹⁴ , Masao Kikuchi ¹⁴ , Aki Hosogai ¹⁴ , Masato Katsuta ¹⁴ , Yasuhiro Nakamura ¹⁴ <i>1 Graduate School of Engineering, Hokkaido University, Japan, 2 Faculty of Engineering, Gifu University, Japan, 3 Faculty of Science and Engineering, Hirosaki University, Japan, 4 Glenn Research Center, National Aeronautics and Space Administration, USA, 5 Department of Mechanical Engineering, University of California, Berkeley, USA, 6 Inst. d'Alembert, Université Pierre-et-Marie Curie-Paris6, France, 7 School of Engineering, The University of Tokyo, Japan, 8 Graduate School of Engineering, Toyohashi University of Technology, Japan, 9 Faculty of Textile Science and Technology, Shinshu University, Japan, 10 White Sands Test Facility, National Aeronautics and Space Administration, USA, 11 Jacobs Technology Inc., USA, 12 European Space Research and Technology Center, European Space Agency, 13 Japan Space Forum, Japan, 14 Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency, Japan</i>	38
8:55-9:15	17Com-2	A Simplified Model for Predicting Flammability Limits of Thermally-Thin Materials with Low Ambient Flow Shuhei Takahashi ^{1*} , Knadai Tsuboi ¹ , Keisuke Maruta ¹ , Tadayoshi Ihara ¹ , Subrata Bhattacharjee ² <i>1 Department of Mechanical Engineering, Gifu University, Japan, 2 Department of Mechanical Engineering, San Diego State University, USA</i>	38
9:15-9:35	17Com-3	Influence of Char Region in Paper Sample on Spreading Flame Formed in an Opposed Air Flow Under Microgravity Condition Hiroyuki Torikai*, Akihiko Ito, Tatsuya Inai <i>Graduate School of Science and Technology, Hirosaki University</i>	38
9:35-9:55	17Com-4	Effect of Wire Insulation Material on Its Flammability in Normal and Micro-Gravity Ken Mizutani*, Kyosuke Miyamoto, Nozomu Hashimoto, Osamu Fujita <i>Mechanical and Space Engineering, Hokkaido University, Japan</i>	39

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[Com] Combustion Science Room B Chair: Hiroshi Nomura, Co-Chair: Masao Kikuchi			
10:30-10:55	17Com-6K	Large-Scale Space Fire Safety Research and Associated Activities Grunde Jomaas ¹ , David L. Urban ² , Gary A. Ruff ² , Paul Ferkul ² , James S. T'ien ³ , A. Carlos Fernandez-Pello ⁴ , Jose L. Torero ⁵ , Guillaume Legros ⁶ , Christian Eigenbrod ⁷ , Sandra Olson ² , Nickolay Smirnov ⁸ , Osamu Fujita ⁹ , Sebastien Rouvreau ¹⁰ , Balazs Toth ¹¹ , Olivier Minster ¹¹ , Marika Orlandi ^{12*} , Adam J. Cowland ¹³ <i>1 Department of Civil Engineering, Technical University of Denmark, Denmark, 2 NASA John H. Glenn Research Center, National Aeronautics and Space Administration, USA, 3 Dept. of Mechanical and Aerospace Engineering, Case Western Reserve University, USA, 4 Mechanical Engineering, University of California, Berkeley, USA, 5 School of Civil Engineering, The University of Queensland, Australia, 6 Institut Jean le Rond d'Alembert, Université Pierre et Marie Curie, France, 7 ZARM, University of Bremen, Germany, 8 Department of Mechanics and Mathematics, Moscow Lomonosov State University, Russia, 9 Division of Mechanical and Space Engineering, Hokkaido University, Japan, 10 Belisama R&D, France, 11 Physical Sciences Office, Directorate of Human Spaceflight and Operations, European Space Agency, The Netherlands, 12 Materials Space Evaluation and Radiation Effects Section, Directorate of Technical and Quality Management, European Space Agency, The Netherlands, 13 BRE Centre for Fire Safety Engineering, The University of Edinburgh, United Kingdom</i>	39
10:55-11:15	17Com-7	Fire Safety in Manned Spaceflight: Flame Propagation along Corrugated Surfaces Christian Eigenbrod ^{*1} , Florian Meyer ² , Tim Schwentek ² , Alexander Freier ² , Maximilian Ruhe ² , Patrick Bihn ² <i>1 Center of Applied Space Technology and Microgravity, ZARM, University of Bremen, Germany, 2 UB-FIRE, University of Bremen, Germany</i>	40
11:15-11:35	17Com-8	A Study of Fire Safety Assessment for Human Space Flight Program Using Limiting Oxygen Index (LOI) -The Effect of Buoyancy on Extinction Limit - Aki Hosogai ^{1*} , Yuji Nakamura ² , Kaoru Wakatsuki ³ , Hiroyuki Shimamura ¹ , Masato Katsuta ¹ , Yasuhiro Nakamura ¹ <i>1 Space Environment Utilization Center, Japan Aerospace Exploration Agency, Japan, 2 Department of Mechanical Engineering, Toyohashi University of Technology, Japan, 3 Faculty of Textile Science and Technology, Shinshu University, Japan</i>	40
11:35-11:55	17Com-9	A Key Factor for Successful Ignition to Assess Reasonable Flammability Limit in Space Yuya Sugamura ^{1*} , Yuji Nakamura ¹ , Aki Hosogai ² <i>1 Department of Mechanical Engineering, Toyohashi University of Technology, Japan, 2 Space Environment Utilization Center, Japan Aerospace Exploration Agency, Japan</i>	40
11:55-12:15	17Com-10	Attempt in Heat Flux Measurement at Near Flammability Limit of Burning Solids for Fire Safety in Space Fuzuki Noda ^{1*} , Aki Hosogai ² , Takeshi Yokomori ³ , Yuji Nakamura ¹ <i>1 Department of Mechanical Engineering, Toyohashi University of Technology, Japan, 2 Space Environment Utilization Center, Japan Aerospace Exploration Agency, Japan, 3 Faculty of Science and Technology, Keio University, Japan</i>	41
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9:15-9:35	17Be-3	Combustion Synthesis in Space Exploration Galina Xanthopoulou ¹ , Anna V. Gubarevich ² , Hiroyuki Wada ² and Osamu Odawara ^{2*} <i>1 National Center of Scientific Research "DEMOKRITOS", Athens, Greece, 2 Tokyo Institute of Technology, Yokohama, 226-8502 Japan</i>	42
9:35-9:55	17Be-4	Industrialization of Space: Microgravity Based Opportunities for Material and Life Science Ioana Cozmuta ^{1*} , Lynn D Harper ² , Daniel J Rasky ² , Alexander MacDonald ³ , Robert B Pittman ⁴ <i>1 Science and Technology Corporation, Space Portal, NASA Ames Research Center, 2 Space Portal, NASA Ames Research Center, 3 Emerging Space Office, Office of Chief Technologist, NASA HQ, 4 Wyle Labs, Space Portal, NASA Ames Research Center</i>	43
9:55-10:15	17Be-5	ECLSS and Microgravity Science for Beyond the ISS Masato Sakurai <i>JAXA</i>	43
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11:15-11:35	17Be-8	Hierarchical Autonomous Control Method for Material Circulation Control of an Advanced Life Support System Masakatsu Nakane ^{1*} , Yoshio Ishikawa ^{1*} , Hiroyuki Miyajima ^{2*} <i>1 Nihon University, 2 Tokyo Jogakkan College</i>	44
11:35-11:55	17Be-9	Utilization of the Terrestrial Cyanobacteria Hiroshi Katoh ^{1*} , Mika Yokoshima ² , Shunta Kimura ² , Jun Furukawa ² , Kaori Tomita-Yokotani ² <i>1 Mie University, Japan, 2 University of Tsukuba, Japan</i>	44

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8:50-9:10	17Th-2	Interfacial Phenomena and Thermophysical Properties of Molten Steel and Oxides - Fundamental Research of Steel Processing Using Electrostatic Levitation Furnace (ELF) - Masahito Watanabe ^{1*} , Toshihiro Tanaka ² , Takao Tsukada ³ , Takehiko Ishikawa ⁴ , Haruka Tamaru ⁴ <i>1 Gakushuin University, Japan, 2 Osaka University, Japan, 3 Tohoku University, Japan, 4 JAXA, Japan</i>	46
9:10-9:30	17Th-3	Ground-based Studies of Materials Science in Korea Supporting Space Experiments Joonho Lee ^{1,2} <i>1 Department of Materials Science & Engineering, Korea University, Republic of Korea, 2 The Korean Microgravity Society, Republic of Korea</i>	46
9:30-9:50	17Th-4	Influence of Oxygen Partial Pressure on Surface Tension for Molten Copper Measured by Oscillating Droplet Method Using Electromagnetic Levitation Shumpei Ozawa, Yuto Takei, Masaru Nishimura and Kazuhiko Kuribayashi <i>Chiba Institute of Technology</i>	46
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[Cr] Crystal Growth Room D Chair: Koich Kinoshita, Co-Chair: Takehiko Ishikawa			
10:30-10:55	17Cr-1K	The Critical Growth Rate for Particle Incorporation During the Directional Solidification of Solar Silicon Under Microgravity Tina Sorgenfrei ^{1*} , Thomas Jauß ¹ , Arne Cröll ¹ , Maral Azizi ² , Christian Reimann ² , Jochen Friedrich ² , Martin Volz ³ <i>1 Crystallography, Albert-Ludwigs-University, Freiburg, Germany, 2 Fraunhofer IISB, Erlangen, Germany, 3 NASA Marshall Space Flight Center, Huntsville, Alabama, USA</i>	47
10:55-11:15	17Cr-2	SiGe Crystal Growth by the Traveling Liquidus-Zone Method aboard the International Space Station Kyoichi Kinoshita ^{1*} , Yasutomo Arai ¹ , Yuko Inatomi ¹ , Takao Tsukada ² , Hiroaki Miyata ³ , Ryota Tanaka ³ , Keita Abe ² , Sara Sumioka ² , Masaki Kubo ² , Satoshi Baba ² <i>1 Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency, Japan, 2 Department of Chemical Engineering, Tohoku Univ. Japan, 3 Development Division, Advanced Engineering Services Co. Ltd., Japan</i>	47
11:15-11:35	17Cr-3	A Numerical Study on SiGe Crystal Growth Process by the TLZ Method in the International Space Station Keita Abe ¹ , Sara Sumioka ¹ , Satoshi Baba ¹ , Masaki Kubo ¹ , Takao Tsukada ^{1*} , Ken-ichi Sugioka ² , Kyoichi Kinoshita ³ , Yasutomo Arai ³ , Yuko Inatomi ³ <i>1 Dept. of Chem. Eng., Tohoku Univ., Japan, 2 Dept. of Mech. Sys. Eng., Toyama Pref. Univ., Japan, 3 Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency, Japan</i>	48
11:35-11:55	17Cr-4	Growth of Doped Ge and Ge-Si Crystals Under μg and 1g Conditions to Determine the Influence of Solutocapillary Melt Convection Tina Sorgenfrei ^{1*} , Adam Hess ¹ , Jan Zähringer ¹ , Arne Cröll ¹ , Alexander Egorov ² , Alexander Senchenkov ² <i>1 Crystallography, Albert-Ludwigs-University, Freiburg, Germany, 2 NIISK, Research and Development Institute for Launch Complexes, Russia</i>	48
11:55-12:15	17Cr-5	Growth Properties of InGaSb Ternary Alloys Under Microgravity and Normal Gravity Conditions Velu Nirmal Kumar ^{1*} , Govindasamy Rajesh ¹ , Tadanobu Koyoma ¹ , Yoshimi Momose ¹ , Yuko Inatomi ² , Kaoruho Sakata ² , Takehiko Ishikawa ² , Masahito Takayanagi ² , Shigeaki Kamigaichi ² , Tetsuo Ozawa ³ , Yasunori Okano ⁴ , Yasuhiro Hayakawa ¹ <i>1 Research Institute of Electronics, Shizuoka University, Japan, 2 Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency</i>	48
[IT-Dr] Droplet Room A Chair: Yutaka Abe, D. Brutin			
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8:55-9:15	17IT-Dr-2	Thermocapillary Droplet Actuation on a Wall Anja Fath ^{1,2*} , Dieter Bothe ¹ <i>1 Mathematical Modeling and Analysis, Technische Universität Darmstadt, Germany, 2 Graduate School CE, Technische Universität Darmstadt, Germany</i>	49
9:15-9:35	17IT-Dr-3	Effect of Evaporation Behavior on Internal and External Flow Structures of an Acoustically Levitated Droplet Atsushi Goda ^{1*} , Motonori Niwa ² , Koji Hasegawa ³ , Tetsuya Kanagawa ² , Akiko Kaneko ² , Yutaka Abe ² <i>1 Graduate school of System and Information Engineering, University of Tsukuba, Japan, 2 Department of Mechanical Engineering, Kogakuin University, Japan, 3 Department of Engineering Mechanics and Energy, University of Tsukuba, Japan.</i>	49
9:35-9:55	17IT-Dr-4	Development of Viscosity Measurement Using Rotational Breakup Method of Electrostatically Levitated Droplet Soma Watahiki ^{1*} , Satoshi Matsumoto ² , Tetsuya Kanagawa ¹ , Akiko Kaneko ¹ , Yutaka Abe ¹ <i>1 Graduate school of System and Information Engineering, University of Tsukuba, Japan, 2 Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency, Japan</i>	50
9:55-10:15	17IT-Dr-5	Heat Flux Density Near the Liquid-Gas-Solid Contact Line in Evaporating Drop Igor V. Marchuk ¹ , Andrey L. Karchevsky ² and Oleg A. Kabov ^{1*} <i>1 Kutateladze Institute of Thermophysics SB RAS, Novosibirsk, Russia, 2 Sobolev Institute of Mathematics SB RAS, Novosibirsk, Russia</i>	50

[IT-PB] Pool Boiling Room A

Chair: Anthony Robinson, Hitoshi Asano

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10:55-11:20	17IT-PB-2K	Preparation for Single Bubble Pool Boiling Experiment Aboard SJ-10 and Preliminary Results Jian-Fu ZHAO ¹ , Zheng-Dong LI ¹ , Hui-Xiong LI ² , Ke WU ¹ , Kai LI ¹ <i>1 Key Laboratory of Microgravity (National Microgravity Laboratory)/CAS, Institute of Mechanics, Chinese Academy of Sciences (CAS), Beijing, China. 2 State Key Laboratory of Multiphase Flow in Power Engineering, Xi'an Jiaotong University, Xi'an, China</i>	51
11:20-11:40	17IT-PB-3	Performance of Experiments for Evaporation and Condensation Onboard Chinese Cargo Spacecraft Zhi-Qiang Zhu ^{1*} , Qiu-Sheng Liu ¹ , Zhen-Qian Chen ² , Zhen-Hui He ³ , Lei Yan ⁴ , Jing-Chang Xie ¹ <i>1 Institute of Mechanics, Chinese Academy of Sciences, China, 2 School of Energy & Environment, Southeast University, China, 3 Center for Space Technology, Sun Yat-sen University, China, 4 Technology and Engineering Center for Space Utilization, Chinese Academy of Sciences, China</i>	51
11:40-12:00	17IT-PB-4	Electric Field Replacement of Buoyancy: Gas Bubbles Experiment in Microgravity Conditions Paolo Di Marco [*] , Nicolo' Morganti, Giacomo Saccone <i>DESTEC, University of Pisa, Italy</i>	51

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[Cr] Crystal Growth Hardy Hall

Chair: Alexander E. S. Van Driessche, Co-Chair: Yoshihisa Suzuki

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8:50-9:10	18Cr-2	Multipathways of Nucleation in Highly Supersaturated Solution Geun Woo Lee [*] , S. Lee, H. Wi, W. Jo, Y. C. Cho, Y. I. Kim <i>Korea Research Institute of Standards and Science, Republic of Korea</i>	53
9:10-9:35	18Cr-3K	Oscillatory Growth of Ice Basal Face Observed in Supercooled Water with Antifreeze Glycoprotein -Ice Crystal 2 Experiments- Yoshinori Furukawa ^{1*} , Ken Nagashima ¹ , Shunichi Nakatsubo ¹ , Izumi Yoshizaki ² , Haruka Tamaru ² , Taro Shimaoka ³ , Takehiko Sone ⁴ , Etsuro Yokoyama ⁵ , Takao Maki, Asuka Yamamoto ⁶ , Harutoshi Asakawa ¹ , Ken'ichiro Murata ¹ , Gen Sazaki ¹ <i>1 Institute of Low Temperature Science, Hokkaido University, Japan, 2 Japan Aerospace Exploration Agency, Japan, 3 Japan Space Forum, Japan, 4 Japan Manned Space Systems Corporation, Japan, 5 Gakushuin University, Japan, 6 Olympus Co.Ltd, Japan</i>	53
9:35-9:55	18Cr-4	Protein Clusters and Crystals Dominique Maes ^{1*} , Alexander ES Van Driessche ¹ , Mike Sleutel ¹ , Marco AC Potenza ² , Marzio Giglio ² , Maria A Vorontsova ³ , Peter G Vekilov ³ <i>1 Structural Biology Brussels, Vrije Universiteit Brussel, Belgium, 2 Department of Physics, Universita di Milano, Italy, 3 Department of Chemical and Biomolecular Engineering and Department of Chemistry, University of Houston, United States</i>	54
9:55-10:15	18Cr-5	Recent Advances on the Ground-Based Experiments of Protein Crystallization after the NanoStep Project Yoshihisa Suzuki ^{1*} , Katsuo Tsukamoto ² , Takahisa Fujiwara ³ , Tomohiro Shiimoto ⁴ , Daido Nakahashi ⁴ , Izumi Yoshizaki ⁵ , Seijiro Fukuyama ⁶ , Masaru Tachibana ⁷ , Haruhiko Koizumi ⁸ , Shin-ichiro Yanagiya ¹ , Yasutomo Arai ⁵ , Makoto Natsuisaka ⁵ <i>1 Institute of Technology and Science, Tokushima University, Japan, 2 Graduate School of Engineering, Osaka University, Japan, 3 Institute of Socio-Arts and Sciences, Tokushima University, Japan, 4 Graduate School of Advanced Technology and Science, Tokushima University, Japan, 5 Japan Aerospace Exploration Agency, Japan, 6 Advanced Engineering Services Co., Ltd., Japan, 7 Graduate School of Nanobioscience, Yokohama City University, Japan, 8 Institute for Materials Research, Tohoku University, Japan</i>	54

[Cr] PANEL DISCUSSION: "Dose Microgravity Improve the Quality of Protein Crystals?" Hardy Hall

Chair: Katsuo Tsukamoto, Co-Chair: Dominique Maes

10:30-10:50	18Cr-8	Effects of a Forced Solution Flow on The Step Advancement on {110} Faces of Tetragonal Lysozyme Crystals Mihoko Maruyama ^{1*} , Gen Sazaki ² , Hiroaki Adachi ³ , Masashi Yoshimura ¹ and Yusuke Mori ^{1,3} <i>1 Grad. School of Eng. Osaka Univ., 2 Ins. Low Temp. Sci. Hokkaido Univ., 3 SOSHO Inc.,</i>	54
10:50-11:10	18Cr-7	Growth Rate of Lysozyme Crystals in Space Katsuo Tsukamoto ^{1*} , Yoshihisa Suzuki ² , Hitoshi Miura ³ , Izumi Yoshizaki ⁴ <i>1 Grad School of Science, Tohoku Univ., 2 Inst. Technology and Science, Univ. of Tokushima, 3 Nagoya City Univ., 3JAXA</i>	55
11:15-12:30	18Cr-6	PANEL DISCUSSION: Comments and Discussions from Different Viewpoints by Several Panelists (jointly with IIT Crystal Growth)	55

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8:55-9:15	18Com-2	Percolation Approach for Simulation of Group Combustion Excitation in Randomly Distributed Droplet Clouds Based on Flame-Spread Characteristics with Two-Droplet Interaction in Microgravity Herman Saputro ^{1,2*} , Takehiko Seo ¹ , Masato Mikami ¹ <i>1 Graduate School of Science and Engineering, Yamaguchi University, Japan, 2 Department of Mechanical Engineering Education, Sebelas Maret University, Indonesia</i>	56
9:15-9:35	18Com-3	Flame-Spread Behavior Between Two n-Decane Droplets with Different Droplet Diameters in Microgravity Naoya Motomatsu*, Narita Sano, Herman Saputro, Takehiko Seo, Masato Mikami <i>Graduate School of Science and Engineering, Yamaguchi University, Japan</i>	56
9:35-9:55	18Com-4	Flame-Spread Characteristics of n-Decane Droplet Arrays at Different Ambient Pressures in Microgravity Narita Sano*, Naoya Motomatsu, Herman Saputro, Takehiko Seo, Masato Mikami <i>Graduate School of Science and Engineering, Yamaguchi University, Japan</i>	57
9:55-10:15	18Com-5	Regression Behavior of PMMA Burning with Twin GOX Impinging Jets Tsuneyoshi Matsuoka ^{1*} , Kyohei Kamei ² , Yuji Nakamura ¹ , Harunori Nagata ³ , Susumu Noda ¹ <i>1 Department of Mechanical Engineering, Toyohashi University of Technology, 2 Graduate school of Engineering, Toyohashi University of Technology, 3 Division of Mechanical and Space Engineering, Hokkaido University</i>	57
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Chair: Shuheï Takahashi, Co-Chair: Yuji Nakamura			
10:30-10:55	18Com-6K	Formaldehyde LIF-Diagnostics of the Autoignition of n-Decane Droplet Pairs in Microgravity Christian Eigenbrod ^{*1} , Konstantin Klinkov ¹ , Michael Peters ¹ , Guenther Marks ¹ , Wolfgang Paa ² , Volker Wagner ² , Wolfgang Triebel ² <i>1 Center of Applied Space Technology and Microgravity (ZARM), University of Bremen, Germany, 2 Institute of Photonic Technology, IPHT Jena, Germany, 6 Institute of Photonic Technology, IPHT Jena, Germany</i>	57
10:55-11:15	18Com-7	Microgravity Experiment Project on Spontaneous Ignition of Multiple Fuel Droplets near Ignitable Limit Using a TEXUS Sounding Rocket Osamu Moriuue ^{1*} , Masao Kikuchi ² , Hiroshi Nomura ³ , Masato Mikami ⁴ , Mitsuaki Tanabe ⁵ , Yusuke Suganuma ³ , Christian Eigenbrod ⁶ , Konstantin Klinkov ⁶ , Jakob Hauschild ⁶ <i>1 Faculty of Engineering, Kyushu University, Japan, 2 Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency, Japan, 3 College of Industrial Technology, Nihon University, Japan, 4 Faculty of Engineering, Yamaguchi University, Japan, 5 College of Science and Technology, Nihon University, Japan, 6 Center of Applied Space Technology and Microgravity, University of Bremen, Germany</i>	58
11:15-11:35	18Com-9	Effects of Gravity on Ignition Characteristics of MMA/Air Mixtures in Laser-Induced Spark Ignition Process Yoshinari Kobayashi*, Shinji Nakaya, Mitsuhiro Tsue <i>Department of Aeronautics and Astronautics, The University of Tokyo, Japan</i>	58
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10:55-11:15	18En-6	The Integrated Controller in SJ10 Yu Qiang, Guo Lin, Zhao Xunfeng*, Geng Baoming, Wang Xiaoqing <i>Center for Space Science and Applied Research, Chinese Academy of Sciences</i>	61
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11:35-11:55	18En-8	Development of the Unit of Vapor-Gas Separator and Condensed Liquid Collector for Mixture of Air and FC-72 Vapor on the TZ1 Wan Wu ¹ , Xinbing Zhang ¹ , Xubin Liao ¹ , Zhenrui Wang ¹ , Jiajun Xia ¹ , Hanwei Hou ¹ , Zhencheng Huang ¹ , Shousen Zheng ¹ , Zhenhui He ^{1,2*} <i>1 Center for Space Technologies, School of Physics and Engineering, 2 State key laboratory of Optoelectronic Materials and Technologies, Sun Yat-Sen university, Guangzhou, PR China</i>	62
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[IT-CL] Contact Line and Physics Room A

Chair: Jianfu Zhao, Paolo Di Marco

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8:55-9:15	18IT-CL-2	Flow Distribution Control in Meso Channels via Electrohydrodynamic Conduction Pumping in the Presence of Phase Change Lei Yang, Michal Talmor and Jamal Seyed-Yagoobi <i>Worcester Polytechnic Institute, Mechanical Engineering Department</i>	63
9:15-9:35	18IT-CL-4	Contact-Line Microregion in Pure Vapor for a Finite Thermal Conductivity of the Superheated Substrate Alexey Rednikov*, Pierre Colinet <i>Université Libre de Bruxelles, TIPS Laboratory, Brussels, Belgium</i>	63
9:35-9:55	18IT-CL-5	Heat and Mass Transfer at a Free Surface with Non-Isothermal Boundary Conditions in a Single Species System Under Microgravity Michael Dreyer <i>ZARM, Department of Fluid Mechanics, Faculty of Production Engineering - Mechanical and Process Engineering, University of Bremen, Germany</i>	64

[IT-FB] Flow Boiling and Spray Room A

Chair: Osamu Kawanami, Yonghai Zhang

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11:55-12:15	17IT-PB-5	Subcooled Boiling of Fluorochemical Liquid with Poor Wetting Heating Surface Koichi Suzuki ^{1*} , Kazuhisa Yuki ¹ , Shinichi Satake ² , Ryoji Imai ³ , Yasuhisa Shinmoto ⁴ , Haruhiko Ohta ⁴ <i>1 Department of Mechanical Engineering, Tokyo University of Science-Yamaguchi, Japan, 2 Department of Applied Electronics Engineering, Tokyo University of Science, Japan, 3 Department of Mechanical, Aerospace and Materials Engineering, Muroran Institute of Technology, Japan, 4 Department of Aeronautics and Astronautics, Kyushu University, Japan</i>	66

Poster session on 16 September

Chair: Yuji Nakamura, Co-Chair: Kazumi Kogure

General Posters

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Ph-GL-P01	Numerical Simulation Of Heat and Fluid Flow in the 3-Phase Contact Line Region Stefan Batzdorf*, Peter Stephan <i>Institute for Technical Thermodynamics, Technische Universität Darmstadt, Germany</i>	68
Bo-GL-P01	Future ESA Experiments in Two-Phase Heat and Mass Transfer Research on-board the International Space Station Balazs Toth ^{1*} , Olivier Minster ² , Hans Ranebo ³ on behalf of ESA's Science, Payload Development and Operations teams, Science Teams and Space Industries <i>1 HE Space Operations for ESA, The Netherlands, 2 Physical Sciences Office, Directorate of Human Spaceflight and Operations, European Space Agency, The Netherlands, 3 ISS Payload Development, Directorate of Human Spaceflight and Operations, European Space Agency, The Netherlands</i>	68
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